Jet Test

User's Manual

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Introduction

Brief Explanation of how the Inkjet Cartridge Works

The inkjet cartridges that JetTest will analyze have 48 separate jet elements and jet orifices to deliver ink to the page. Each jet element is made up of a microscopic sized resistor that the printer energizes and de-energizes at various times. Positioned over each jet element is a jet orifice to deliver the ink. When the printer applies power to the jet element it heats the ink (that is covering it) to the boiling point. When the ink over the element boils it "jets" out of the corresponding orifice onto the paper. The microscopic resistors that make up the jet elements can burn out, short or drift out of tolerance with time and use. JetTest analyzes each jet element and the cartridge identifier elements to verify that the cartridge meets original factory specifications. JetTest reports the results to the operator and stores the statistical data for each cartridge type tested.

Information About JetTest

Your New JetTest Inkjet Cartridge Analyzer is a precision microcomputer controlled test instrument. It has been hand crafted from the finest materials and workmanship available. JetTest is designed to perform for years without any maintenance other than normal cleaning. JetTest will thoroughly analyze all electrical jet elements of the HP51625, HP51626, HP51629, HP51649, HPc1816, HPc6614, HP51633 and HP51639 Black, Cyan, Magenta and Yellow inkjet cartridges. It is also capable of print testing each of these cartridges. JetTest enables the operator to know the functionality of these inkjet cartridges before and after refilling them. This saves time and materials in the refilling process that could otherwise be wasted on non-functioning cartridges. It also assures that the finished product is fully functional and will satisfy the customers needs.

The JetTest Inkjet Cartridge Analyzer performs a complete self-diagnostic check on all of its internal electrical functions when power is applied. This diagnostic check is also performed every time a cartridge is removed from the test station. An important part of this self-diagnostic check is monitoring and confirming the calibration of the JetTest system. Once the self-diagnostic check has been passed the JetTest system announces that it is ready for use by lighting the Green System Ready light, announcing the "Ready sound" and prompting the operator to insert a cartridge for test on the display. When a cartridge is loaded into the test station it detects which cartridge type has been loaded and automatically starts the cartridge analysis process. The analysis is complete within a few seconds and the results are reported to the operator in several possible ways. Panel lights always indicate the results of the analysis process. Additionally, results can be announced by special sounds from a built in speaker and displayed on the LCD panel display.

The operator can easily change system preferences or obtain cartridge statistics by selecting choices from the menu on the panel display. Test result statistics for each cartridge type are stored and are available to the operator through a menu selection. The results for each cartridge type can be displayed, and/or cleared from the statistics menu. JetTest will retain all cartridge analysis data and system preferences for up to three years without being connected to power.

Cartridges

JetTest analyzes and print tests the following cartridges:
HP51625 – HP51626 – HP51629 – HP51649 – HPc1816A – HPc6614 – HP51633 – HP51639Black, HP51639Cyan, HP51639Magenta, and HP51639Yellow

Technical Specifications

Machine Dimensions:	16” wide X 7” deep X 8” high (41cm X 18cm X 20cm)
Work Space Requirements:	20” X 18” (50cm X 46cm)
Power Requirements:	110 VAC or 220 VAC 50 – 60 Hz
Standby Power:	3 ea. AA alkaline batteries (Included)
Print Test Paper:	2 ¼” wide printing calculator paper roll

Getting Started

Preparing JetTest for use

Inspect the shipping container carefully for damage or missing items from the list in this section. If any items are missing or damaged contact your dealer immediately. Contact the shipping company or agent if damage has occurred in shipping.

Your JetTest inkjet cartridge analyzer comes with the following items:

1 ea. JetTest inkjet cartridge analyzer
1 ea. Wall plug power adapter with cables
3 ea. Print test paper rolls (1 loaded in place)
1 ea. User’s manual

Place your JetTest inkjet cartridge analyzer on a suitable work surface. Allow enough room on the work surface for cartridges: - those to be tested, - cartridges that test good and - cartridges that test bad. You may also want to allow a space for those that test marginal. JetTest will identify cartridges that fall just outside the factory specifications but are still functional. These cartridges can still be used and may last one more refill cycle but their life expectancy is not that of a cartridge that meets original factory specifications.

Plug the power connector from the wall plug power adapter into the back of the JetTest inkjet cartridge analyzer first. Next plug the wall plug adapter into an appropriate wall plug outlet. If you are in the United States you should be using 110 VAC. Most other countries use 220-240 VAC. Make sure you are using the proper wall plug power cord for your area. The wall plug power adapter automatically adjusts to put the correct power to the JetTest Cartridge Analyzer.

When power is applied the JetTest system will initialize and perform its self-diagnostic check. During the self-diagnostic check the system will light all panel lights at once and then turn each light off in sequence, momentarily cycle the paper feed drive motor in both directions, and then make a single beep tone. When this is complete it will indicate that the system is “ready” by lighting the Green System Ready light and the panel display will display that the system is ready to test a cartridge.

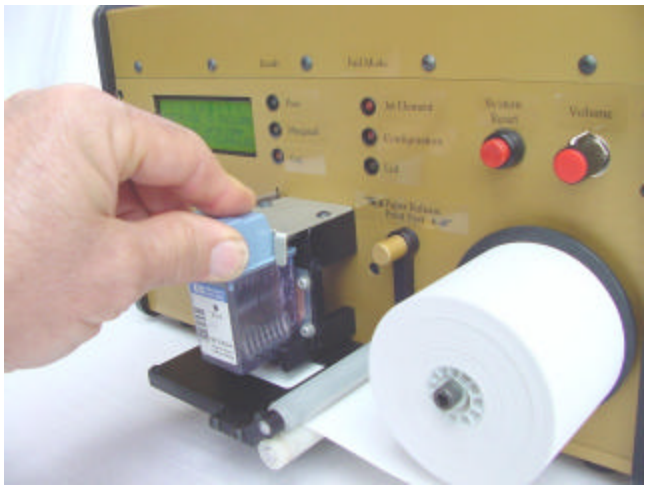
If the print test paper roll is not already loaded in place – load the roll by sliding it onto the paper spool shaft until the spool drops behind the retaining washer at the end of the shaft. Place the roll on the spool shaft with the paper coming off the roll in the downward direction on the right side of the roll. Pass the paper under the roll and into the paper drive rollers. Move the paper release lever to the left to lower the bottom roller away from the drive roller and slide the paper into the slot of the paper guide plate. The paper drive roller will rotate to assist the feed. Release the paper release lever when the paper begins to exit the guide plate on the left side. This completes the setup and preparation of the JetTest inkjet cartridge analyzer.

> NOTE: Moving the "Paper Feed/Print Test" lever to the left with no cartridge loaded into the test station will power the paper feed drive and allow you to adjust the paper in the guide plate. Moving the "Paper Feed/Print Test" lever to the left and then releasing it after a cartridge test has completed will initiate the cartridge print test.

If the cartridge is good and has properly functioning jets the cartridge will print a visible pattern on the paper. Examining the print test will show if each jet is clear and functioning properly or if jets are plugged or partially plugged. More details and example diagrams of this test are explained later in the print test section.

Machine Operation

Loading and testing a Cartridge



Select a cartridge to be tested and examine the printed circuit side of the cartridge to see if it is clean and free of ink residue. Clean the contacts on the cartridge with a soft damp cloth or damp paper towel if it is not clean. Make sure the contacts are dry before testing. Load the cartridge into the test station with the print head down and the circuit contacts facing the contacts in the test station (See the photo to the left). The cartridge loads into the test station exactly like it loads into a printer. Tip the print head into the lower section of the test station lowering it until it bottoms on the holding blocks. Rock the upper end of the cartridge towards the contacts snapping it into position. The spring plate locks the cartridge in place as illustrated in the accompanying photos.

As the cartridge snaps into position the testing cycle begins automatically. The Yellow panel light labeled "Marginal" will blink to show that the system is in the process of testing the cartridge. The analysis will complete in about 7 seconds with the results displayed on the panel lights and display. Panel light displays are explained below:

Pass – Indicates that the cartridge passed all electrical tests.

Pass – Marginal - Indicates that the cartridge passed with one or more jet elements measuring marginal. This cartridge will function normally but may have a limited life expectancy. (A marginal jet element means that it is slightly out of original factory tolerance.)

Fail – Indicates that the cartridge failed one or more electrical tests.

If a cartridge fails any electrical tests the failure mode will be reported on the panel light displays under the label "Fail Mode". Failure modes along with an explanation follow:

Jet Element – Indicates that the cartridge had one or more jet element failures.

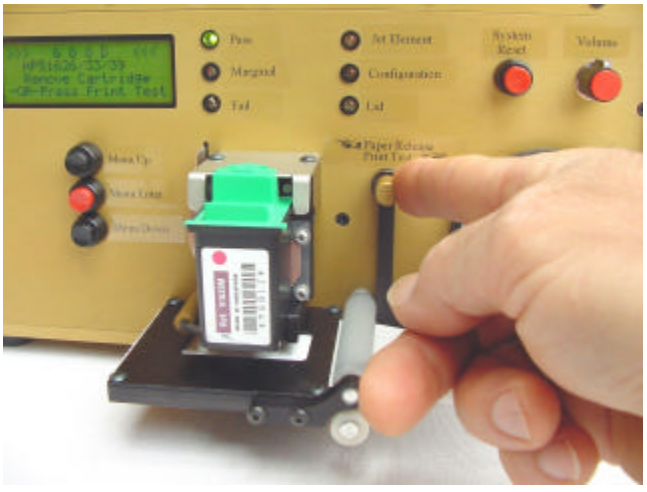
Configuration – Indicates the cartridge's electronic identifier elements have failed.

Lid – Indicates that the cartridge failed because the lid does not match the configuration identifier elements for this cartridge. This could be because the wrong lid was put on the cartridge during the remanufacturing process. It could also be caused by the configuration elements failing in a mode that made the cartridge appear to be a different type – not matching this lid.

Fail – Marginal - Indicates that the cartridge failed and had at least one or more jet elements measuring marginal.

Remove the cartridge at the completion of the test by pulling back on the upper part of the cartridge to dislodge it from the spring plate and place it in the appropriate category (good or bad) area or container.

Print Test a cartridge



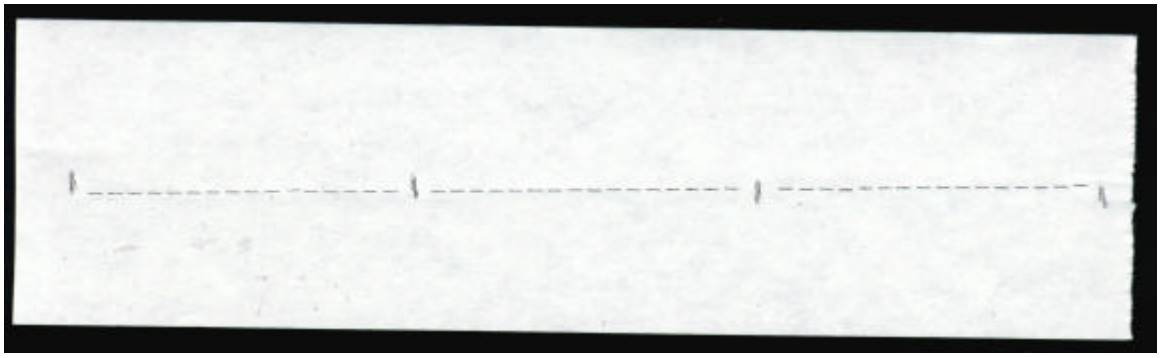
Print testing a cartridge is a simple operation. First make sure there is paper loaded onto the machine. Make sure it is threaded properly between the paper drive rollers and into the paper guide plate beneath the cartridge test station. Insert a cartridge to be tested into the test station. Wait until the analysis is complete and then move the "Paper Feed/Print Test" lever to the left, pause and then back to the right. The paper drive will feed the test paper with the print pattern deposited by the cartridge being tested. When the print test is complete tear the paper off by pulling up and out towards you with a quick pull using the paper guide plate as a tear-off edge.

Examine the pattern printed by the cartridge being tested. You should see three groups of 16 horizontal 1/8" (3mm) repeating thin lines broken with short breaks separated by three vertical

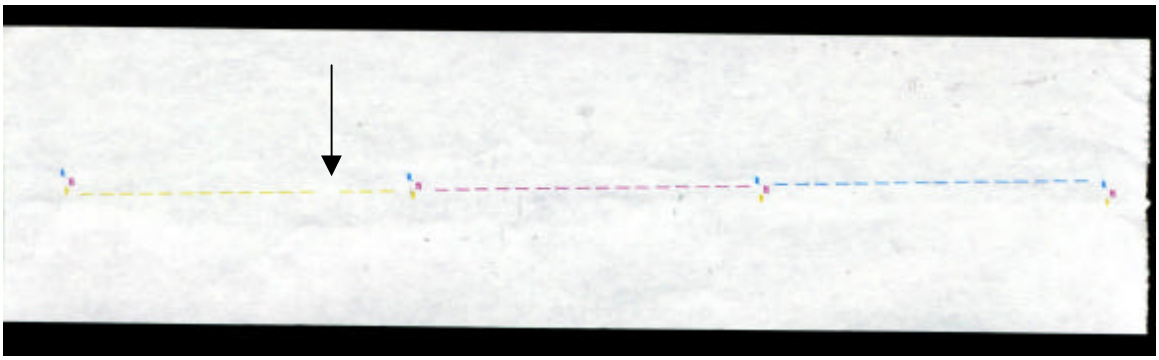
patterns. If a jet nozzle is plugged or **NOT** functioning it will stand out as a wide gap in the print pattern. If you see a fuzzy or splattered pattern in any part of the test it is an indication of a partially plugged jet nozzle. If the cartridge test reports a good cartridge and the print test shows a plugged or partially plugged nozzle the cartridge is in need of cleaning. Below are examples of print test patterns demonstrating different print test results.

NOTE: If the "Map" Display feature is set to "ON" in the display preferences you must press the "Menu Enter" button to finish displaying the results of the test before the print test feature will operate. The map display will remain on the panel display until the "Menu Enter" button is pressed.

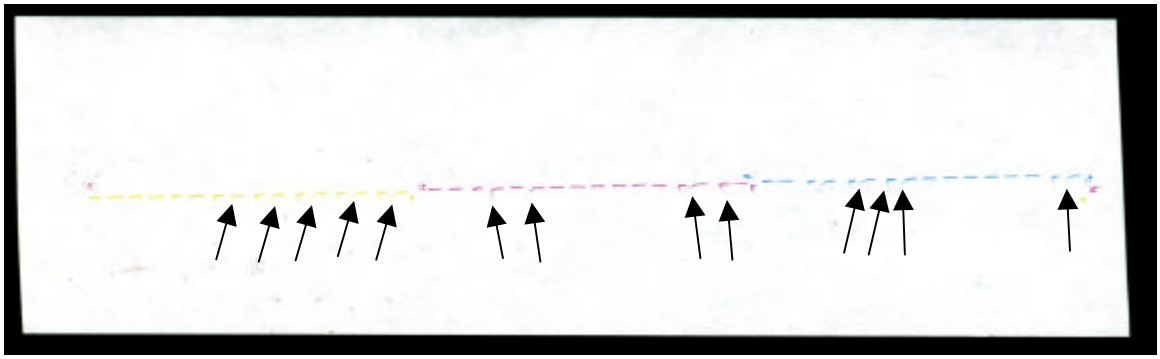
The print test will end automatically after print testing each jet nozzle. Move the "Paper Feed/Print Test" lever again to print another print test pattern.



Sample of a good black cartridge print test



Sample of a color cartridge print test with one jet plugged (arrow points to plugged jet)

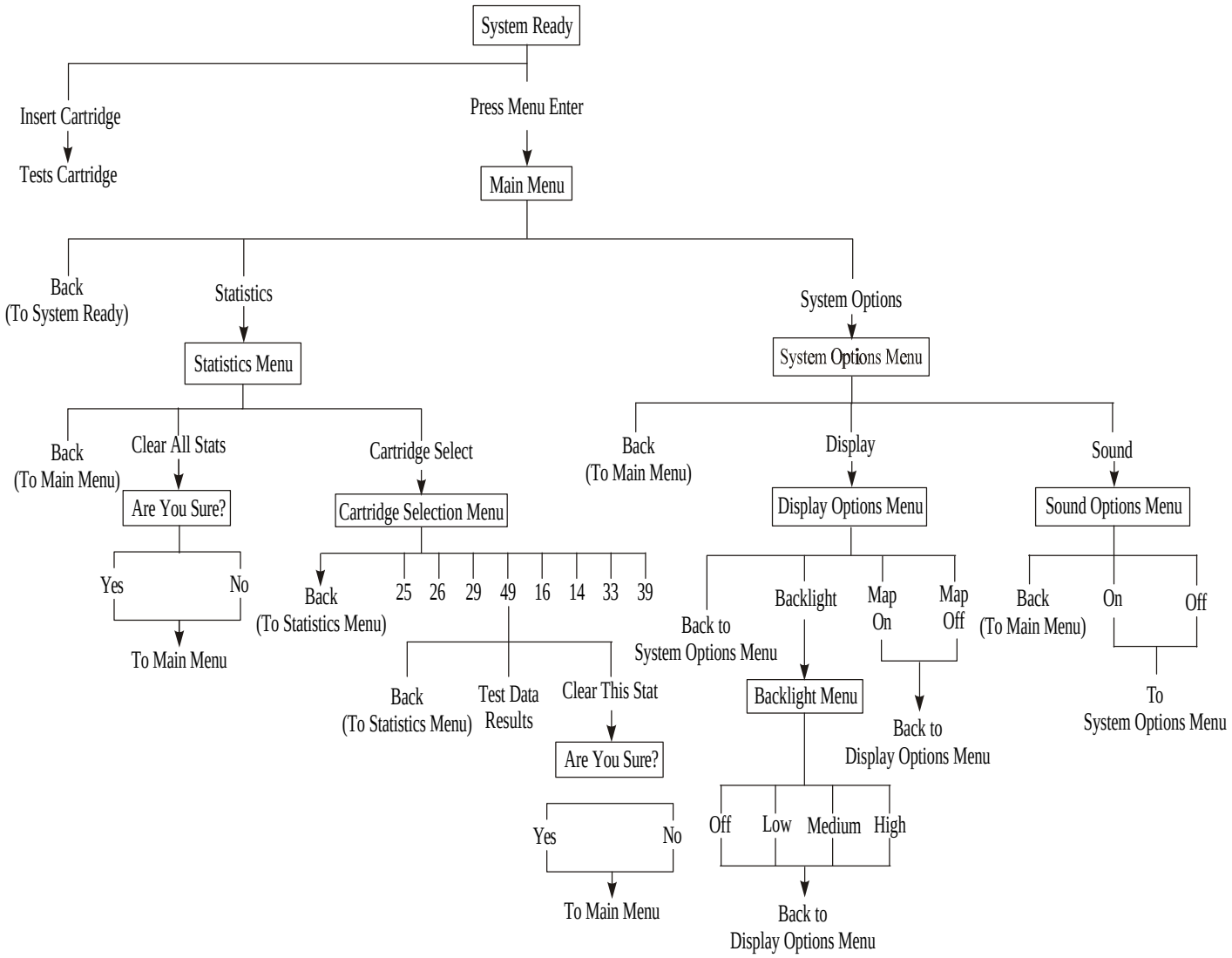


Color cartridge print test showing partially plugged jets

Using the Menu System

JetTest system preferences and cartridge statistics are accessible through a user-friendly menu system. When the system first starts the panel display reports the system version number, the initialization of the self-diagnostic check and then reports that the system is ready. At the "System Ready" level the system prompts the user to either insert a cartridge - or - press the "Menu Enter" button. If the "Menu Enter" button is pressed the system will leave the "System Ready" mode and the display will show the "Main Menu". Pressing the "Menu Up" button moves the cursor up one line. Pressing the "Menu Down" button moves the cursor down one line. If the cursor is at the top or bottom it will wrap around to the next available line. (Example: If the cursor is at the top line and the "Menu Up" button is pressed, the cursor will wrap to the bottom line. If the cursor is at the bottom line and the "Menu Down" button is pressed, the cursor will wrap to the top line.) Once the cursor is moved to the desired selection press the "Menu Enter" button to select the item pointed at by the cursor.

The simplest way to visualize the entire menu system is through the graphic flow chart that follows. It shows where each button push will take you as you maneuver through the menus and shows how to get back to the "System Ready" mode.



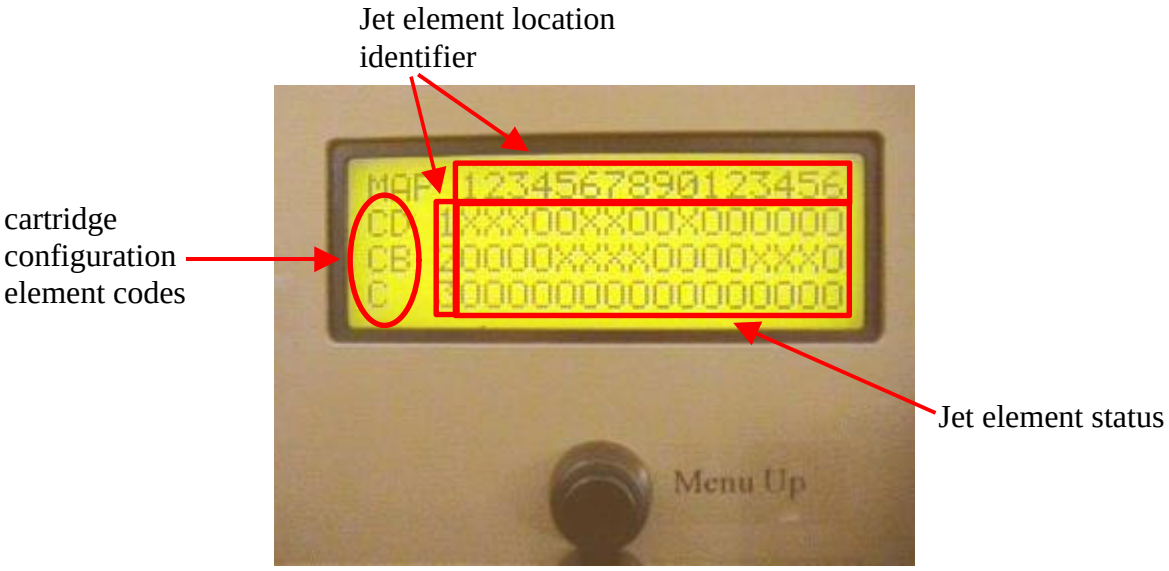
Map Display Feature

Selecting the "Map On" feature through the display options menu will result in a panel display of each electrical element status as it is tested. "**O**" indicates a jet element that meets all original factory electrical specifications. "**?**" indicates a jet element that is functional but falls slightly outside of original factory specifications. These elements are considered "Marginal" and although they will function normally, there is a probability that the cartridge will have a limited life expectancy (it may not be useful for many more refills). "**X**" indicates that the jet element has failed and will not function.

The display is organized to show each jet element and five cartridge configuration element codes. The configuration codes are used to identify the cartridge when it is installed in the printer. There is a pattern of codes for each cartridge number. The chart below identifies the code patterns for each cartridge number tested by JetTest.

HP51625:	HP51626:	HP51629:	HP51649:	HPc1816:	HPc6614:
BE	BC	CD	CD	CB	CE
BC	CC/D	CB	CC	CC	CB
B	D	C	C	C	C

HP51633:	HP51639 B/C/M/Y:
BC	BC
CC/D	DD
D	B



Map Display

NOTE: When using the "Map On" display option removing the cartridge will not automatically put JetTest back to the "System Ready" mode. This is to make sure the display is not mistakenly erased before the operator has time to examine it. The display will remain until the "Menu Enter" button is pressed. When the "Menu Enter" button is pressed the test results will be displayed on the panel lights and announce by the sound system.

Special Notes

JetTest identifies a cartridge by the shape of the lid, the shape of the cartridge and the measured value of the *identifier* electrical elements. The electrical elements of inkjet cartridges sometimes change in value with use and age. This can cause the *identifier* elements to drift to a value that will make one cartridge appear to be a different cartridge type. If this happens JetTest might misidentify a cartridge that has aged. You will be able to detect this condition by the report on the panel display. The cartridge should be rejected even if it tests to be good because there is a high probability that the cartridge is nearing the end of its useful life and will be rejected by the printer when it is installed.

Because JetTest uses three criteria to identify a cartridge it is capable of alerting the operator of a lid mismatch. This condition can occur if a color cartridge (HP51625, HP51649 or HPc1816) has been re-assembled with the wrong lid. For example, if an HP51625 cartridge is refilled and the lid from an HP51649 is attached by mistake, JetTest will alert the operator that there is a lid mismatch. This condition can also be created by *identifier* electrical elements drifting out of tolerance. Although this is a rare condition, JetTest can occasionally misidentify a cartridge in this situation. If there is an indication of a lid mismatch, check the cartridge to see if there has been an error in assembly. The cartridge should be re-assembled correctly and then re-tested.

The HP51626 and HP51633 cartridges are identical electrically. These cartridges will test the same and statistics will accumulate in both cartridge categories. If you are going to test HP51626 or HP51633 cartridges, it is recommended that you clear the statistics for that cartridge type and then check the statistics at the end of the testing session for that cartridge type.

The JetTest Print Test has been carefully designed to apply the lightest possible power to the electrical jet elements to insure that no damage is done to the cartridge. The microcomputer adjusts the power according the cartridge type. If the cartridge does not print all jets even though the electrical elements test good it may be necessary to wet the print head with a damp cloth or paper towel to clear the jets. If the print test is still showing jets that do not print or print erratically it is an indication that the print head needs a thorough cleaning.

The space between the print head and the test paper is wider than when the cartridge is loaded into a typical printer. This extra space helps amplify indications of a partially plugged jet. If a jet has a partial obstruction the test pattern will show a splatter pattern or a curved line for that jet element. Clean the print head and re-test the cartridge.

Replacing the Batteries

The batteries will retain all system preference and statistical data for up to three years with the power removed. Follow the instructions carefully when replacing batteries to make sure data is not lost.

1. Connect power to the JetTest inkjet cartridge analyzer. Make sure the system powers up to the "System Ready" mode.
2. Remove the 12 button head cap screws from the Left side plate.

Battery access this side

3. Allow the Left side plate to lay down flat on the work surface. The battery holder is mounted on the inside of this side plate.
4. Remove and replace the three (3) "AA" Alkaline batteries. Use only Alkaline batteries to ensure data retention for maximum time period.
5. Check all connections on the batteries and battery holder.
6. Replace the Left side plate and the 12 button head cap screws.

Following this procedure will enable all data to be retained. If you replace the batteries without having power connected you will loose system preferences and all statistical data. Also - if you replace the batteries with the power removed from the JetTest system you will be required to apply power to the system twice or press the "System Reset" button to fully initialize the system. The first time power is applied the display will show two blank lines of reversed space characters and the system loads preliminary data. The second application of power or press of the "System Reset" button will initialize the system. System preferences will default to Sound – OFF and Display Backlight – OFF. These preferences can be reset through the menu functions.

Maintenance and cleaning

JetTest is designed to operate for years of service while being nearly maintenance free. Occasional cleaning should be the only maintenance required. If any part of JetTest fails to operate correctly contact your dealer for repair and adjustment options.

JetTest is manufactured with a satin anodized finish. This finish is very durable and stain resistant. Avoid using abrasive cleansers or solvents to clean JetTest. Use only mild detergent and water. Wipe the circuit contacts with a damp cloth or paper towel if they become soiled with ink. Dry circuit contacts thoroughly before loading a cartridge into the test station.

> Note: Momentary power surges or dropouts may cause the JetTest system to freeze. If this occurs press the "System Reset" button on the front panel – or – unplug the power cord at the wall outlet and wait at least 10 seconds before plugging the cord back into the outlet. The JetTest system will re-initialize and be ready for use.